

The intertwined development of cognitive and psychosocial functioning from birth to age 20: risk and protective factors related to educational marginalization

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JLD- Jyväskylä Longitudinal Study of Dyslexia

- Prospective follow-up study of dyslexia
- Longest-running in the world of children born with a family risk for dyslexia, starting from birth
- Aims to identify early precursors of dyslexia by comparing early development of children born with a family risk (108) for dyslexia to controls (92)
- Data includes information of previous generation
- Grade 1 onwards development of classmates (n = 1500 – 2500) has also been followed
- Data collection continues (participants now ~20 years old)



PARENTS

Data collected
in years 1992 - 2012

N = 200

JLD sample
with dyslexia, N = 108
control, N = 92

CHILDREN

Data collected
in years 1993 - 2012

Age 0 - 6 years

N = 200

JLD sample
at risk, N = 108
control, N = 92

Grade 1 - 3

N = 1749 - 2841

JLD sample
at risk, N = 108
control, N = 92

Classmates
N = 1549 - 2641

Grade 7

N = 1634

JLD sample
at risk, N = 101
control, N = 81

Classmates
N = 1452

Grade 9

N = 1641

JLD sample
at risk, N = 101
control, N = 81

Classmates
N = 1459

YOUNG ADULTS

New data gathering
in years 2013 - 2015

Age 20 years

N = 1020 (estimated)

JLD sample
at risk, N = 95
control, N = 75

Classmates
N = 850

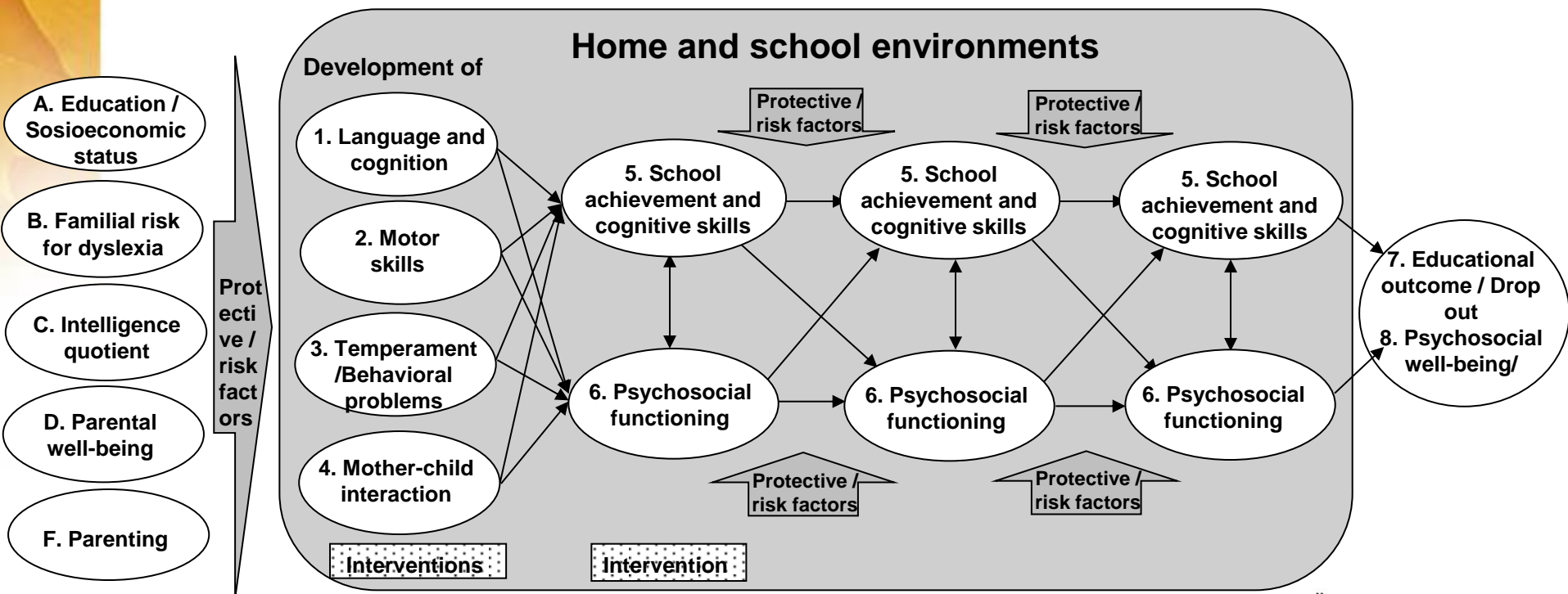


Figure 1. Design of the study and number of participants at different assessment phases.

Research areas of JLD -Skidi-Kids project 2013-2015

- The roles of primary school academic achievement, cognitive skills and psychosocial factors in predicting educational and professional expectations and attainment, as well as personal well-being
- The associations between academic achievement and psychosocial factors during different phases of development
- The early predictors of academic achievement, psychosocial factors and well-being



Examples of Research integrating LD and psychosocial functioning

- Psychosocial functioning of children with and without dyslexia: a follow-up study from 4 to 9 years
- Reading difficulties and motivational factors at the end of primary school (7th – 9th grade)
- Learning difficulties and graduation from vocational school



Psycho-social functioning

... relates to one's **psychological development** in, and in interaction with, a **social environment**.

SEWB: social and emotional wellbeing (Watson, Emery & Bayliss, 2012)

- *EMOTIONAL WELLBEING: happiness, confidence and not feeling depressed*
- *PSYCHOLOGICAL WELLBEING: a feeling of autonomy and control over one's life, problem solving skills, resilience, attentiveness, and a sense of involvement with others*
- *SOCIAL WELLBEING: the ability to have good relationships with others and to avoid distrubtive behavior, delinquency, violence or bullying*

Problems in psychosocial functioning: Social, peer relationship problems, inattention, hyperactivity, internalizing problems, emotional problems, externalizing problems, conduct problems....

Signs of personal ill-being?



Dyslexia & psychosocial functioning

- Dyslexia is linked to difficulties in the social domain, and as externalizing, and internalizing, and attentional problems (e.g., Dahle, Knivsberg & Andreassen, 2011; Morgan, Farkas & Wu, 2012).
- Are problems with psychosocial functioning secondary problems or co-occurring with dyslexia?
 - Previous studies started *after* school entry



Previous findings have been inconsistent in their interpretations:

- Psychosocial problems seen as secondary to learning difficulties (Morgan, Farkas, Tufis & Sperling, 2008; Morgan et al., 2012; Terras et al., 2009; Undheim et al., 2011; Willcutt & Pennington 2000b).
- Psychosocial problems such as poor social skills and externalizing problem behavior also predict reading skills (Halonen, Aunola, Ahonen & Nurmi, 2006; Lim & Kim, 2011; Treszniewski, Moffit, Caspi, Taylor & Maughan, 2008; Stott, 1981).
- JLD data provides a chance to clarify the sequence or co-occurrence of Learning Difficulties and Psychosocial problems

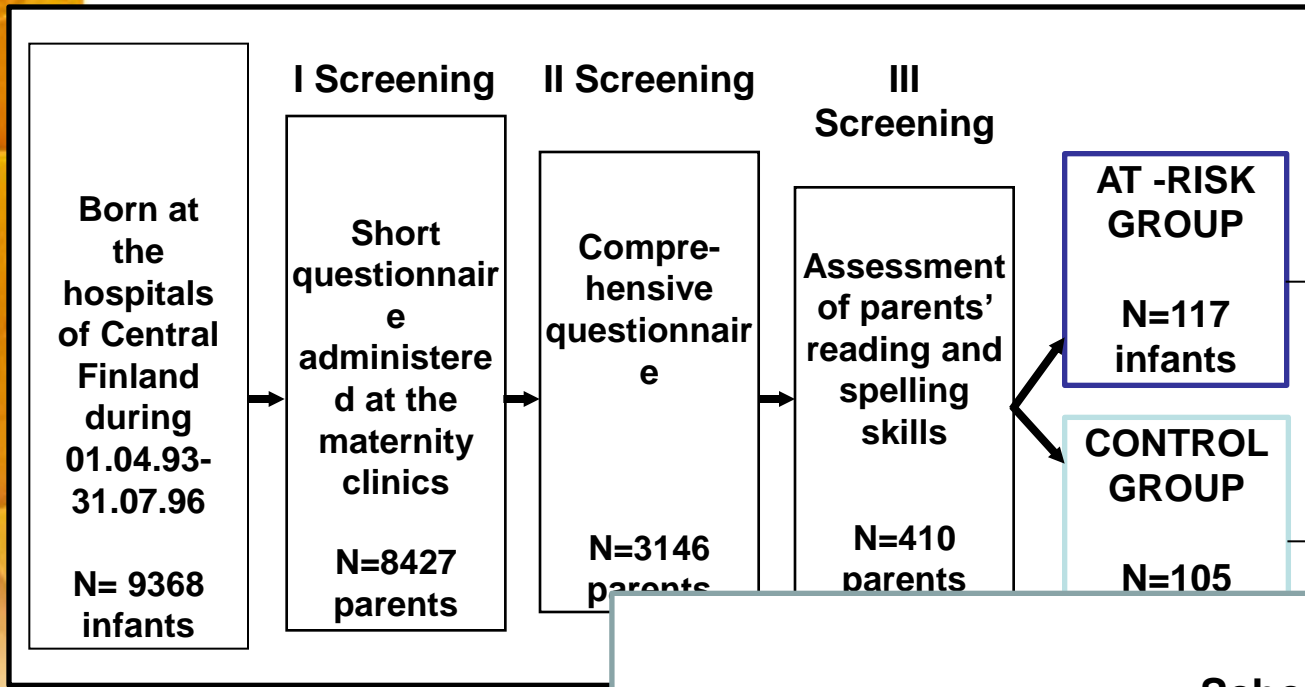
Psychosocial functioning of children with and without dyslexia: a follow-up study from 4 to 9 years: Research questions

1. Are there differences between children with and without dyslexia in psychosocial functioning before school entry (ages 4 and 6 years) and / or after school entry (9 years)?
2. Is the change in psychosocial functioning across school transition (from age 6 to age 9 years) similar or different among children with and without dyslexia ?

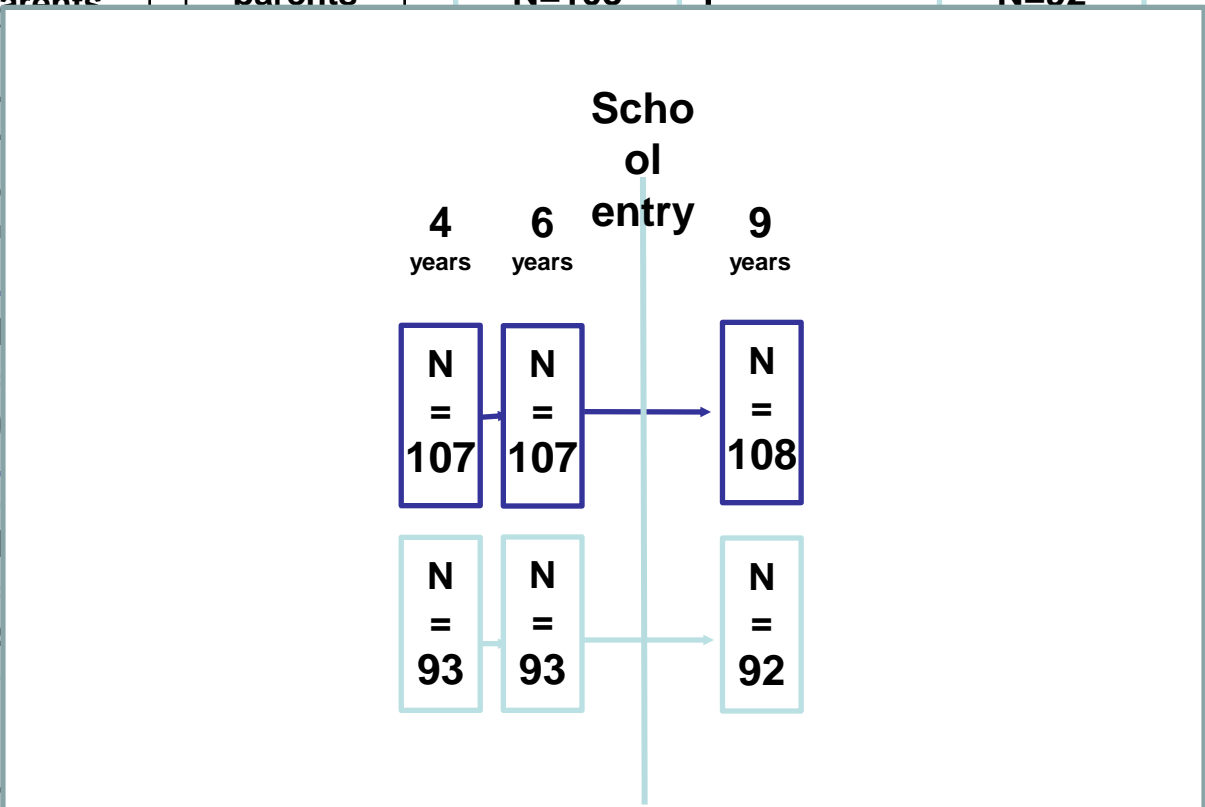
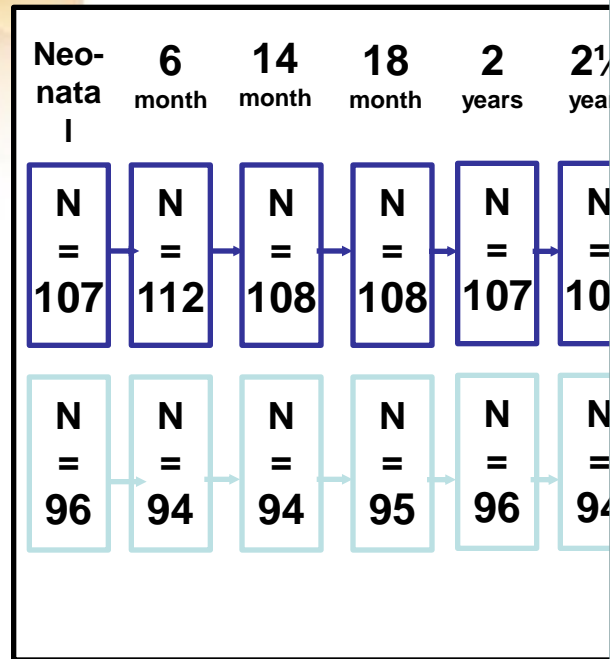
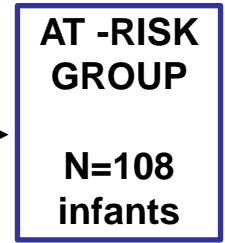


- ❏ Psychosocial problems identified already prior to school entry selectively among children with dyslexia would suggest that the problems are co-occurring with dyslexia rather than secondary consequences of the difficulties in learning to read.
- ❏ An appearance or clear increase in psychosocial functioning problems after school entry selectively among children with dyslexia would suggest psychological functioning problems to be secondary problems reactive to school demands





of children who have attended the last finished assessment phase at the 3rd grade



Method: measures

Dyslexia

- 39 children diagnosed with dyslexia at Grade 2 and 131 children without dyslexia
- Dyslexia diagnosis is based on 4 measures of reading fluency or speed, 4 measures of reading/spelling accuracy
- A 10th percentile cut-off from control group distribution was set as a marker of deficit in each task
- Dyslexia = Deficit in min 3/4 fluency tasks OR min 3/4 accuracy tasks OR min 2 accuracy and 2 fluency tasks

Psychosocial functioning

- Parent Rating Scale of the Behavior Assessment System for Children (BASC, Reynolds & Kamphaus, 1992): 4-point scale ranging from “Never” to “Almost Always”.
- Parental rating scale for pre-schoolers (PRS-P; 126 items) was used at 4 and 6 years
- Parental rating scale for children (PRS-C; 138 items) at 9 years.
 - 1) Adaptive skills** (Adaptability, Social skills),
 - 2) Attention problems,**
 - 3) Externalizing problems** (Aggression, Hyperactivity), and
 - 4) Internalizing problems** (Anxiety, Depression, Somatization).

Results: In Sum

Adaptability and social skills

- Time x Dyslexia: Children with dyslexia had poorer skills prior to school entry.
- ANOVA: more problems prior to school entry: 4 and 6 years .

Note. in particular boys with dyslexia had positive change

Inattention

Children with dyslexia scored higher in inattention; age 4, 6, and 9 years

Time x Gender: increase among girls irrespective of dyslexia status

Externalizing

- No significant effects

Internalizing

- No significant effects



Conclusions

For boys with dyslexia:

- Inattention:
 - problems prior to school entry → co-occurring rather than secondary
- Adaptability and social skills:
 - problems prior to school entry → co-occurring rather than secondary
 - fast development → not secondary problem and not co-occurring across time

For girls with dyslexia:

- Inattention:
 - problems prior to school entry → co-occurring rather than secondary
 - Increase in time for girls with and without dyslexia → not secondary to dyslexia status
- Adaptability and social skills: problems prior to school entry →
 - co-occurring rather than secondary



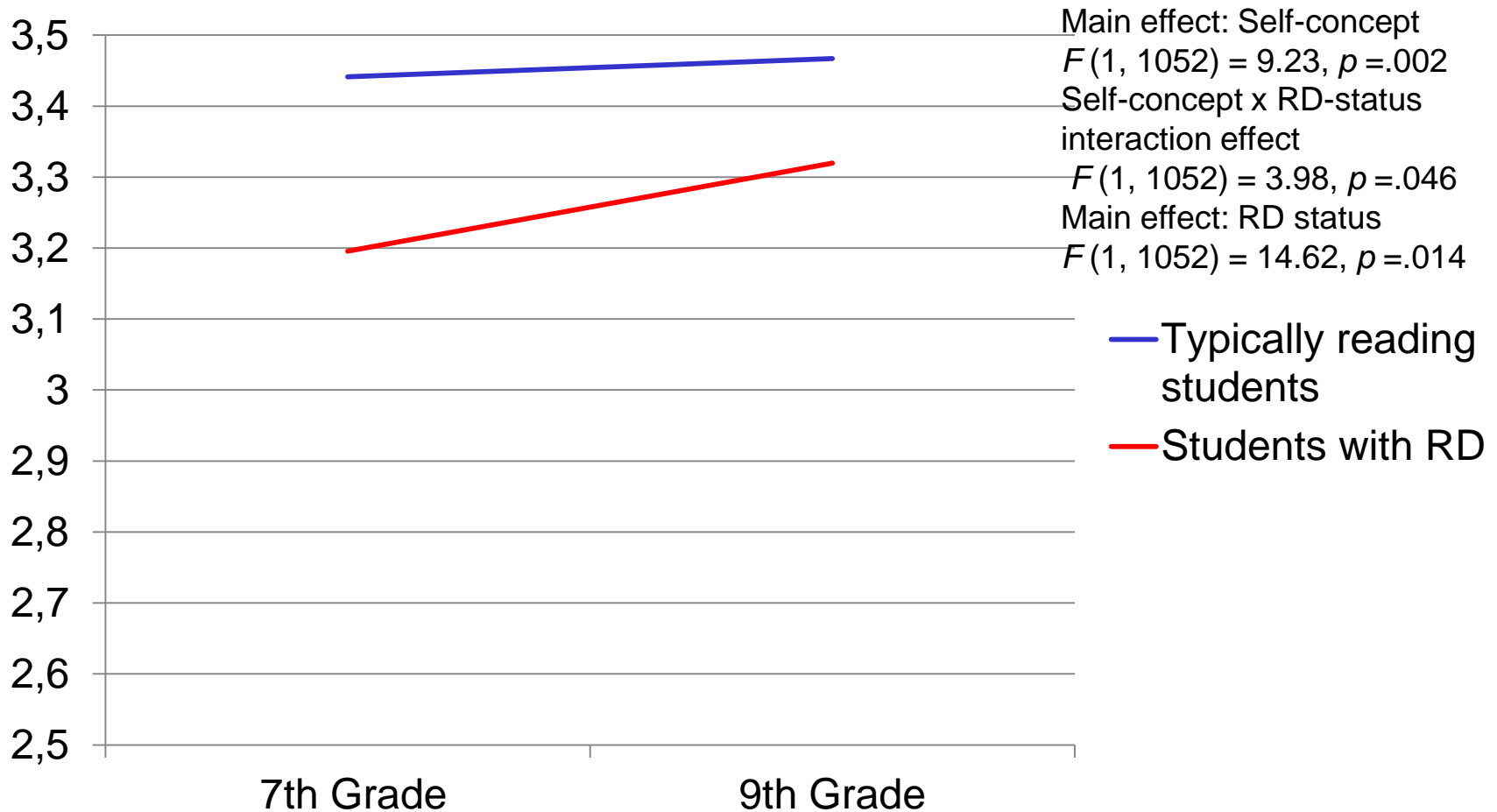
Reading difficulties and motivational factors at the end of primary school (7th – 9th grade): Research questions

1. Does the development of motivation over time (7th – 9th grade) differ among primary school students with and without Reading Difficulties?
 - Motivational factors: Academic self-concept, Task-avoidance, Persistence, Task-value (Finnish, theoretical subjects)
 - Reading Difficulties: A 10th percentile cut-off of three reading fluency tasks at 7th grade
 - Typically reading students N = 964-971, RD students N = 82-83 for longitudinal sample

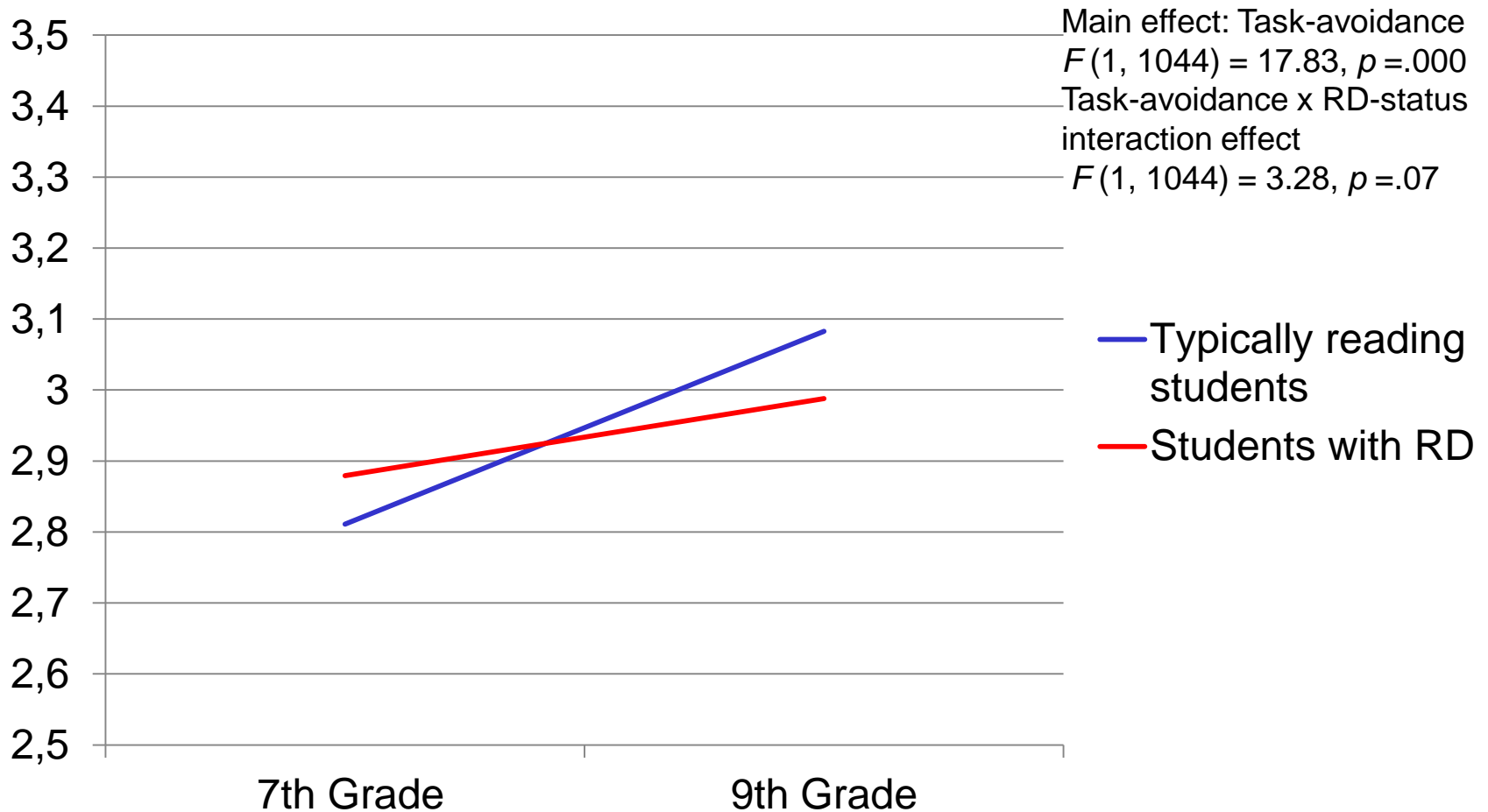
Reading difficulties and motivational factors at the end of primary school (7th – 9th grade): Research questions

2. Is the development of motivation moderated by students' skipping school?
 - 22,8% skip, 77,2% don't skip school at 9th grade
 - Skipping School x RD at 7th grade $\chi^2(1)=ns.$; Skipping school x RD at 9th grade $\chi^2(1)= 7.31^{**}$
 - Don't skip school: Typically reading students N = 709-713, RD students N = 59 for longitudinal sample
 - Skip school: Typically reading students N = 195-196, RD students N = 19 for longitudinal sample

The level of academic self-concept increases more for RD students

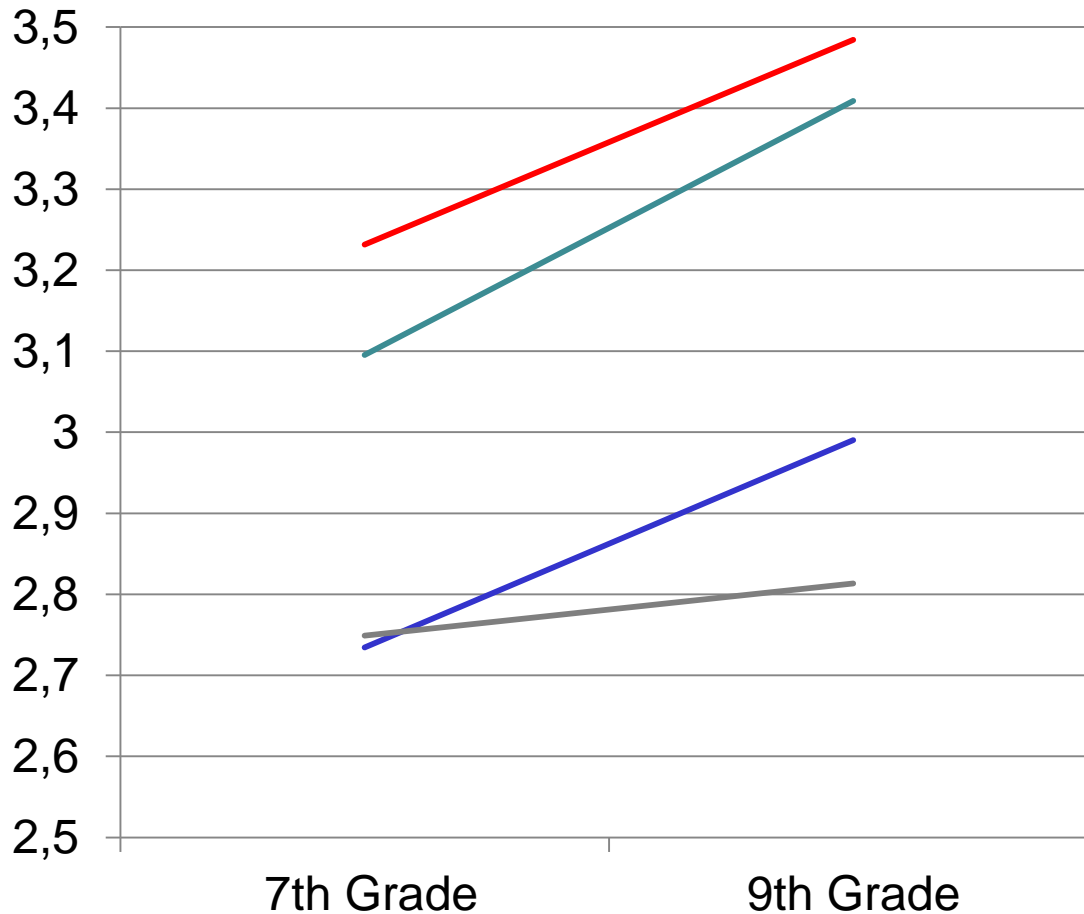


Task-avoidance increases; but probably less for RD students



Skipping school moderates task-avoidance (separate analyses)

Main effect: Task-avoidance
 $F(1, 770) = 9.59, p = .002$
Self-concept x RD-status
interaction effect
 $F(1, 770) = 3.43, p = .064$

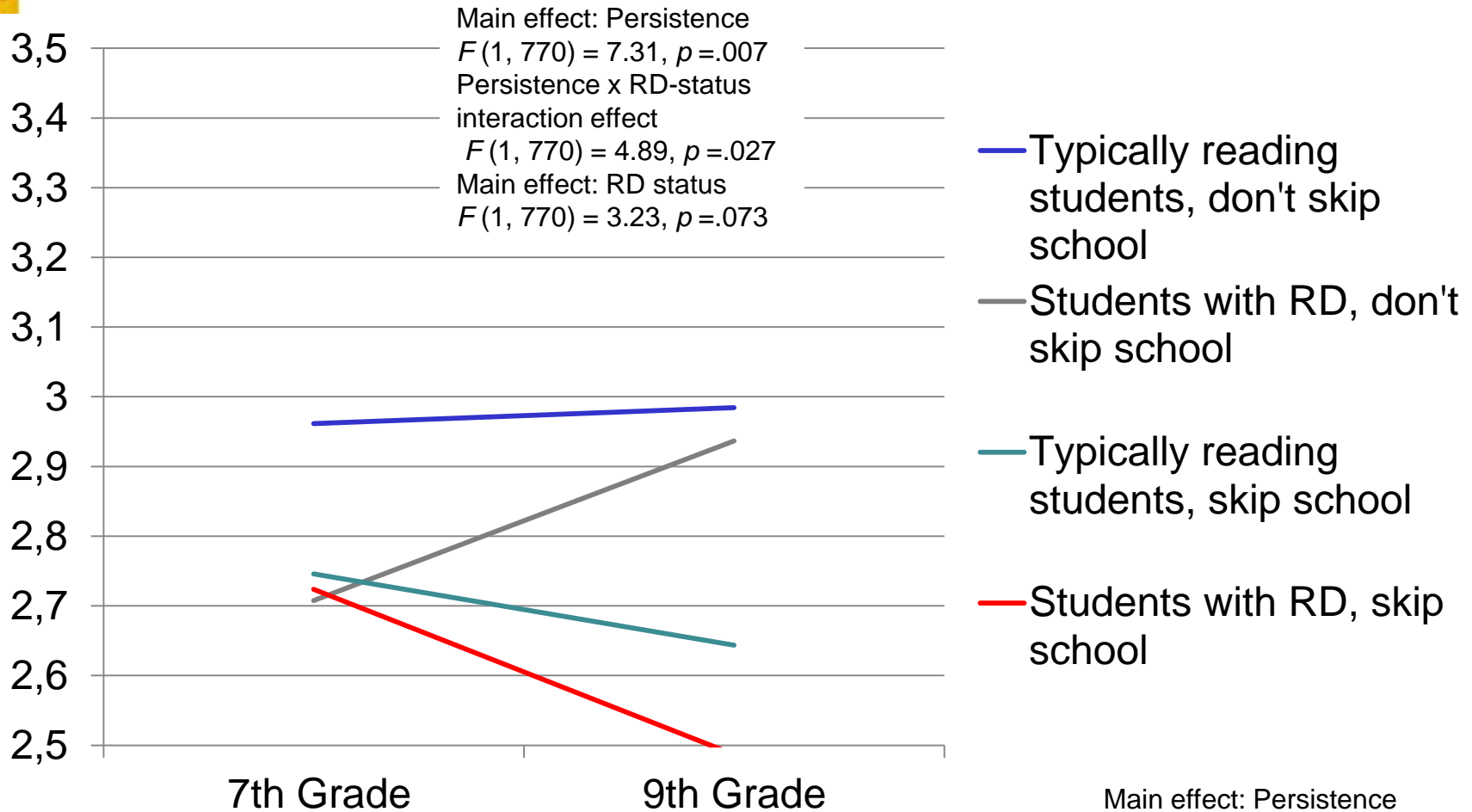


- Typically reading students, don't skip school
- Students with RD, don't skip school
- Typically reading students, skip school
- Students with RD, skip school

Main effect: Task-avoidance
 $F(1, 213) = 7.92, p = .005$

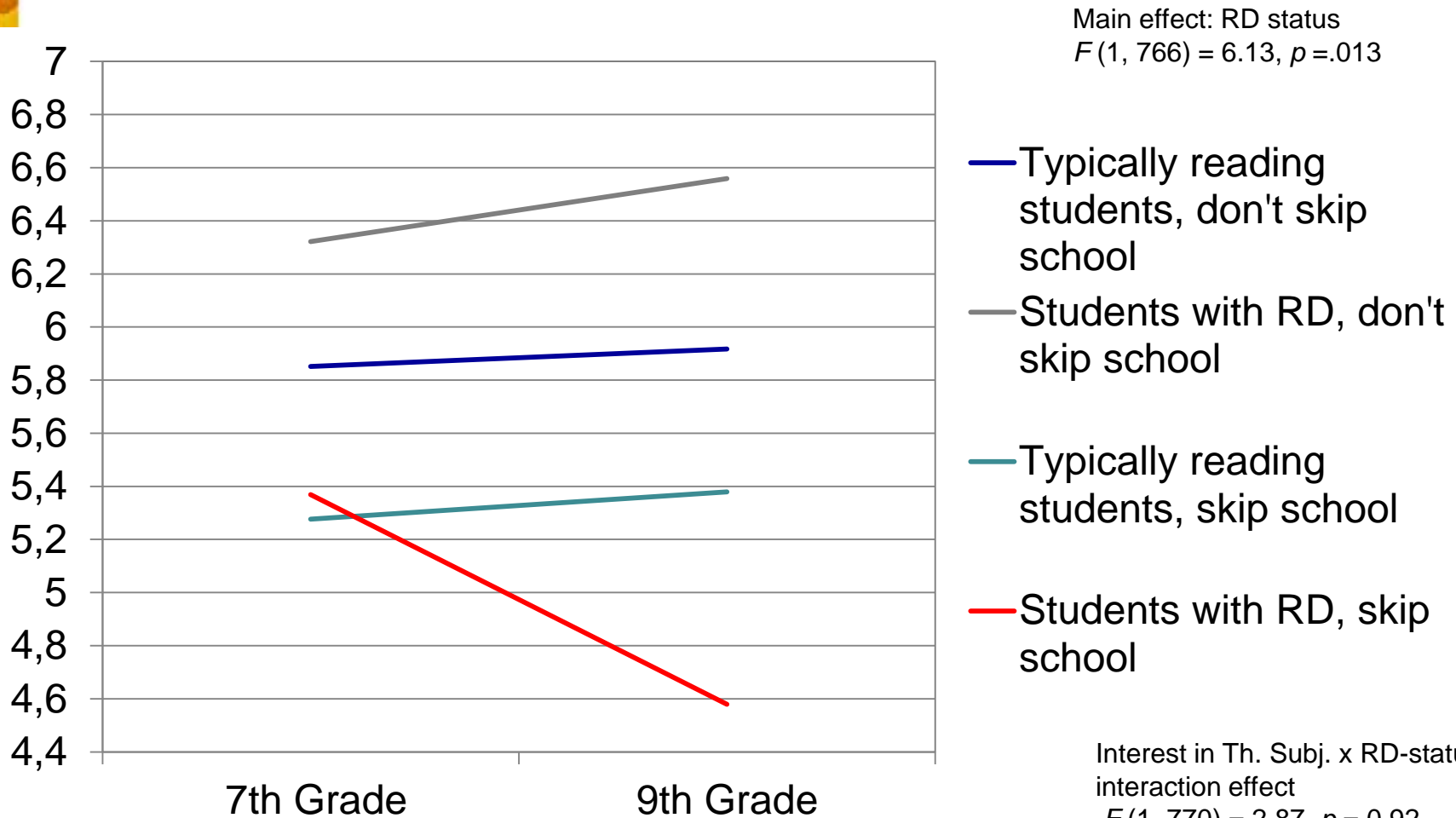
Skipping school moderates persistence

(separate analyses)



Main effect: Persistence
 $F(1, 213) = 3.99, p = .050$

Skipping school moderates Interest in Theoretical Subjects (separate analyses)



Conclusions

- Students with Reading Difficulties show lower motivation than their peers cross-sectionally at 7th and 9th grades
 - Differences in task-avoidance disappear at 9th grade, differences at theoretical subjects become stat. significant
- Academic self-concept of students with RD catches up with their peers over time (in longitudinal sample)
 - Task-avoidance might increase less than that of their peers
- Students with RD are a heterogeneous group
 - Most thrive in school environment, and might even be more persistent, less likely to avoid challenges and be more interested in theoretical subjects than their typically reading peers
 - However, those who skip school show even lower motivation than other students who skip school
 - RD might be an extra burden for students who have trouble at school



Learning difficulties and vocational school graduation

- Taken from another data set (Motivoimaa); N=660
- Lack of Learning difficulties (RD and MD screening test) predicts on-time graduation; however
 - When social environment (vocational qualification/track) *or* motivation (expectations, task-avoidance) is taken into account only Math Difficulties are significant; when social environment *and* motivation are both taken into account Learning Difficulties are not significant predictors of on-time graduation
 - Motivation increases the odds of on-time graduation even when student is on a track with lower probability of graduation and he/she has Learning difficulties!
- With JLD data we can study learning difficulties in school context, taking into account comprehensive school, both academic and vocational tracks, and find out what happens *after* graduation

Future research

- Cognitive and Psychosocial functioning form a dynamic system, over time, which we continue to study
 - For example, how do the students with RD fare in secondary education? What kind of subgroups are there (there probably are subgroups, suggested by moderation by school attendance)? Do some people with RD overcome their problems later? If so, why?
- When the data from the last wave (20 years) becomes available we can predict several interesting and important outcomes, for example:



JLD Measures for 20 year olds

- Life situation
 - e.g. marriage, living arrangement
- Educational outcomes
 - e.g. degrees, qualifications
- Employment
- Hobbies
- Well-being
 - e.g. satisfaction with life, health
- Coping strategies
 - e.g. resilience, motivation
- Social support
 - e.g. social capital, social competence





Thank you!

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